January 31, 2002

Ms. Lynn Brickett
U.S. Department of Energy
National Energy Technology Laboratory
PO Box 10940, MS 922-273C
Pittsburgh, PA 15236-0940

Dear Ms. Brickett:

Subject: JV Task 39 – Determination of the Speciated Mercury Inventory at Four Coal-Fired Boilers Using Continuous Mercury Monitors
Cooperative Agreement DE-FC26-98FT40321; UND Fund 4745

Please find enclosed the October 1 – December 31, 2001, Quarterly Status Report for the subject task. This work was performed at the University of North Dakota Energy & Environmental Research Center under the subject agreement.

If you have any questions, please call me at (701) 777-5138, fax at (701) 777-5181, or e-mail at dlaudal@undeerc.org.

Sincerely,

Dennis L. Laudal
Senior Research Advisor

DLL/llh

Enclosure

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1910-0400

U.S. DEPARTMENT OF ENERGY

FEDERAL ASSISTANCE PROGRAM/PROJECT STATUS REPORT

OMB Burden Disclosure Statement

Public reporting burden for this collection of information is estimated to average 47.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Office of Information Resources Management, AD-241.2 - GTN, Paperwork Reduction Project (1910-0400), U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20585; and to the Office of Management and Budget (OMB), Paperwork Reduction Project (1910-0400), Washington, DC 20503.

1. Program/Project Identification No.	2. Program/Project Title:	3. Reporting Period
DE-FC26-98FT40321	JV Task 39 – Determination of the Speciated Mercury Inventory at Four Coal-Fired Boilers Using Continuous Mercury Monitors	10/1/01 through 12/31/01

4. Name and Address	5. Program/Project Start Date
Energy & Environmental Research Center University of North Dakota PO Box 9018, Grand Forks, ND 58202-9018	4/15/98
	6. Completion Date 3/31/03

7. Approach Changes

Although the scope of work has not changed, the overall schedule was delayed at the request of the Edison Mission Energy (EME).

~ None

8. Performance Variances, Accomplishments, or Problems

This work was initiated for EME to prepare for possible U.S. Environmental Protection Agency (EPA) regulatory measures concerning mercury emissions from coal-fired power plants. EME is gathering data to develop a projection of its total mercury emission inventory as well as mercury speciation. Based on these findings, potential mercury control technologies will be identified.

There are two main objectives for the work. The first is to determine the effect of the selective catalytic reduction (SCR) units on mercury speciation. The second is to help verify the mercury continuous mercury monitors (CMMs) using the Ontario Hydro (OH) mercury speciation method.

The scope of work for this project calls for sampling four boilers at three different plants. Each of the four boilers to be tested uses SCRs for NO_x control. The first two boilers are located at EME's Homer City, Pennsylvania, facility. The other two are located in the Chicago, Illinois, area.

The Homer City facility was sampled from November 5–14, 2001. Although data analysis of the results is still continuing, preliminary results show the following:

- The fly ash generated at this facility is very reactive. Therefore, the inlet OH method data show a high percentage of the mercury as particulate-bound mercury (>80%). For this ash, it appears that speciation at the inlet was biased because of the sample filter. The CMM data and the mercury concentration in the ESP hopper ash will be used to help verify these results.

~ None

9. Open Items

None

10. Status Assessment and Forecast

As stated above, the Homer City plant was sampled in November 2001. The two facilities near Chicago will be sampled in March 2002. A draft final report will be completed by June 30, 2002, and the final report issued by September 1, 2002.

No Deviation from Plan is Expected

11. Description of Attachments

8. Performance Variances, Accomplishments, or Problems (continued)

~ None

12. Signature of Recipient and Date	13. Signature of U.S. Department of Energy (DOE) Reviewing Representative and Date

8. Performance Variances, Accomplishments, or Problems (continued)

- At Unit 1, which used a precleaned coal, the total amount of mercury at the inlet to the electrostatic precipitator (ESP) averaged 16.3 μg/Nm^3. This was considerably lower than at Unit 2, which used the raw uncleaned coal. The average at Unit 3 was 44.3 μg/Nm^3. It appears from these data that the coal-cleaning process removed 63% of the mercury.

- For Unit 1, the ESP removed about 64% of the mercury with SCR bypassed compared to only 35%. There was more removal across the ESP when the SCR was bypassed, about 64% compared to about 30% when the SCR was on-line.

- At Unit 3, >90% of the mercury was oxidized mercury, and although the total amount of mercury was high, the wet FGD removed >90% of the mercury.